SMELT WORKING GROUP
Monday, March 21, 2011

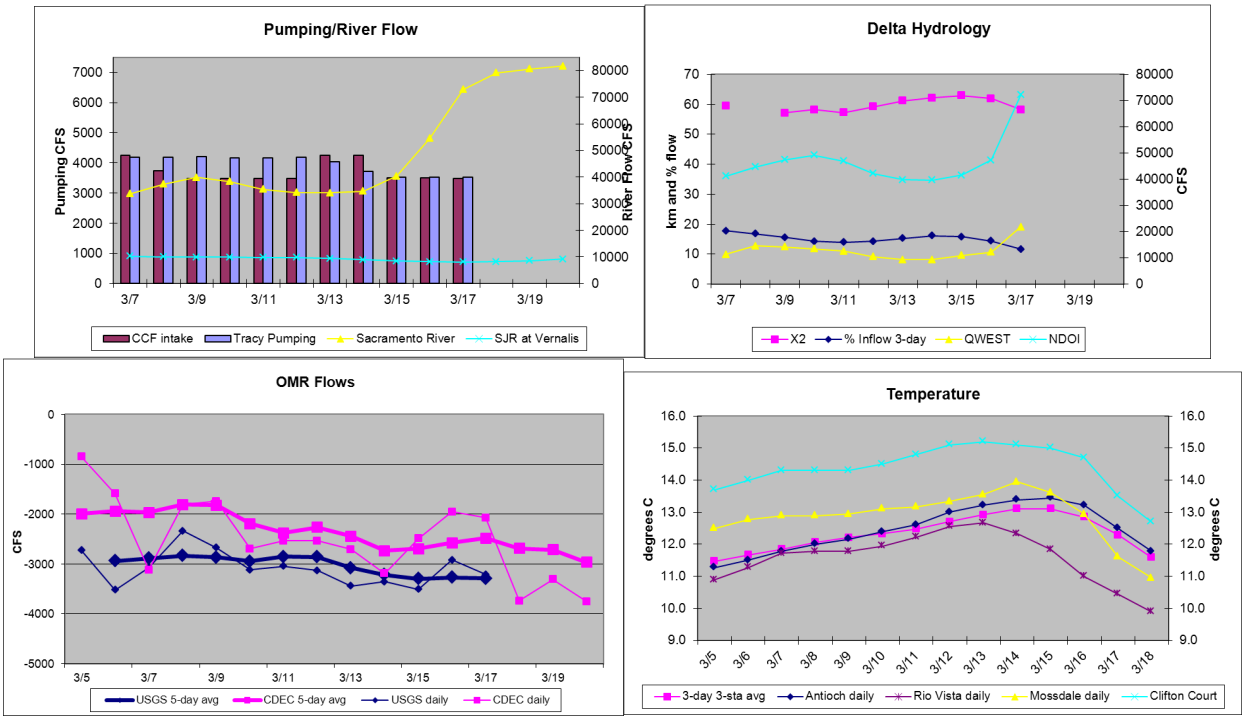
The Working Group will continue to monitor salvage, survey data, and hydrological conditions and will reconvene March 28. No recommendations were made.

1) Current environmental data.

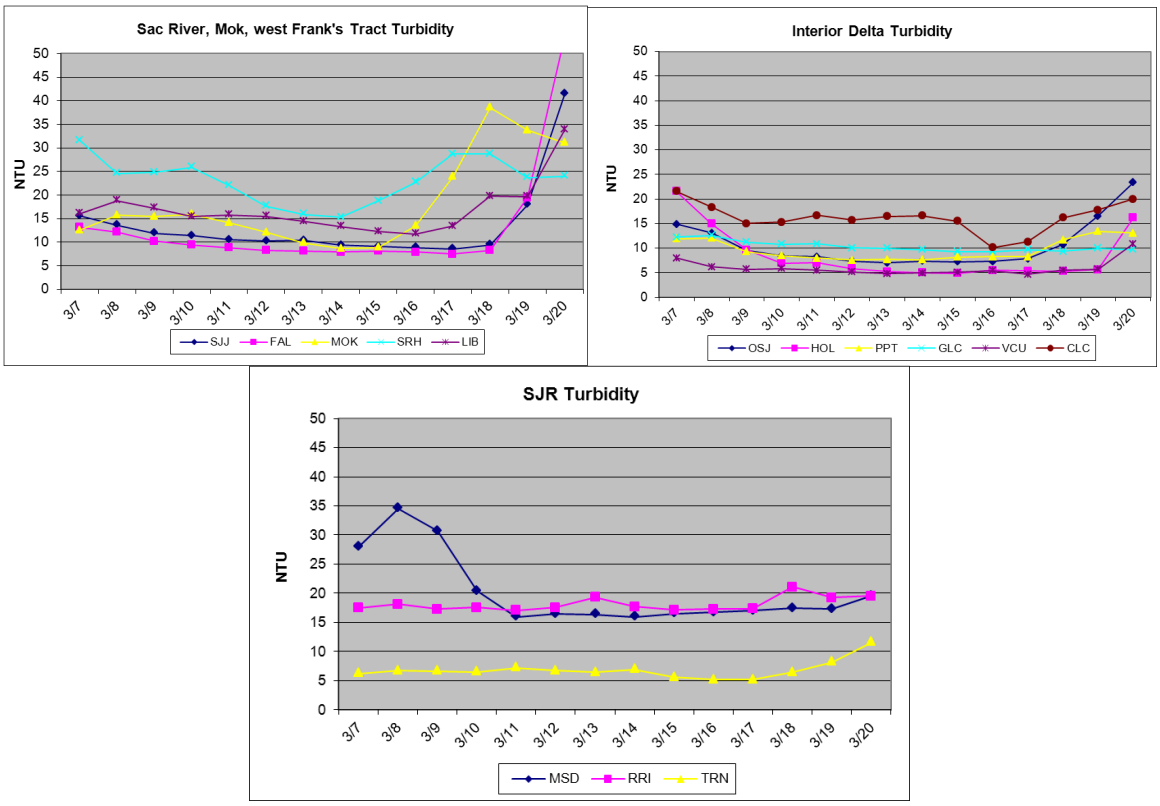
- **Water temperature** for the 3 station average is 11.6°C.

- **OMR** USGS tidally-averaged OMR was -3,213 cfs on March 17, 2011. The 5-day average OMR was -3,289 cfs. The OMR average estimate from CDEC on March 20 was -3,757 cfs. The 5-day CDEC OMR is -2,968 cfs.

- **Flow** Sacramento River inflow is 81,719 cfs and San Joaquin 9,234 cfs. X_2 calculation from CDEC is 58.16 km as of March 17. For March 17, the E/I ratio was 11.6%, QWEST was 21,823 cfs, and NDOI was 72,138 cfs. The graphs below show the most recent trends in Delta hydrology and water quality that were evaluated by the Working Group.



- **Turbidity** Strong weekend storms with high winds and heavy rain have had some effect on Delta turbidities locally, particularly in Franks Tract. Turbidities on the Sacramento River are elevated, but not to the same extent as in a first flush event.



2) Delta fish monitoring:

20mm Survey partial survey #1 was in the field last week. Sample processing is ongoing. No longfin or delta smelt larvae were detected at the central and south delta stations. Station 707 collected 1 delta smelt larva (6mm). Stations 719, 606, and 609 collected 1 adult smelt each, but no larva. Spring Kodiak Trawl #3 was in the field the week of March 7. A total of 52 delta smelt were collected. None were collected in the south and central Delta. 2 spent females were collected: 1 at station 715 and 1 at station 719. 7 ripe females and 3 ripe males were collected. The majority of smelt were collected from the Sacramento Deepwater Ship Channel and Montezuma Slough. Smelt Larva Survey #5 begins this week and SKT #4 begins the week of April 4. The final 2010 FMWT Index is 29 for delta smelt and 191 for longfin smelt. The 2010 Delta Smelt Recovery Index (based on September and October) is 11. More information on the Recovery Index can be found on the Bay-Delta Office's web site at http://www.fws.gov/sfbaydelta/ under "hot topics." Results from larval surveys, SKT, and 20mm Surveys are available online at: http://www.delta.dfg.ca.gov/delta

3) Salvage

No longfin smelt were salvaged from January 18 through March 20. Four adult delta smelt were salvaged at the CVP on January 15 and 17, February 24, and March 15, 19, and 20 for a seasonal cumulative total of 24 fish. No salvage has been reported for longfin smelt or delta smelt at the SWP since June 2010. Criteria for the implementation of an action were not met or exceeded.

4) Expected Project Operations

Combined CVP/SWP exports are around 7,000 cfs as of March 20. The CVP and SWP have filled their shares of San Luis Reservoir. The SWP estimated that their current demand approximately matches their rate of pumping for today (3,500 cfs). The projects are operating to meet the -2,500 cfs OMR flow requirement (as per the NMFS Biological Opinion) today through at least March 23.

5) Particle Tracking Modeling

The Working Group did not request PTM runs for this week.

6) Discussion for Recommendation

The Working Group reviewed and discussed all relevant data from fish surveys, Delta monitoring, salvage, and planned Project operations. No recommendation was made.

RPA Component 1, Action 1 is intended to protect pre-spawning adults during the first flush, as they move into their spawning areas. The WY 2011 first flush has likely passed through the Delta. Component 1, Action 2 (pp 280-281 and Attachment B, pp 352-356) may be implemented following the conclusion of Action 1, or the first flush. Criteria for the implementation of Action 2 are more varied and more flexible than those for Action 1. Action 3 is intended to minimize the entrainment of larval delta smelt. Criteria for the implementation of Action 3 are based upon the onset of spawning or the presence of larvae in the system. Risk of entrainment is estimated based upon survey data, Delta conditions, and the occurrence of salvage.

The 2010 FMWT index for delta smelt is 29. This means that the authorized incidental take of adults is 210 (estimated) and the concern level is 157 (estimated), cumulative for the December through March period. Under the low-entrainment risk scenario for the implementation of Action 2, the salvage criterion is a Daily Salvage Index greater than or equal to 1 (i.e., 29, estimated; B.O. p 338).

The Working Group will continue to evaluate the risk of entrainment according to the guidance provided in the RPA, as in previous years. The recent OCAP settlement does not change any of the parameters that the Working Group is required to discuss (B.O., pp 358-368). However, the newly-created Delta Condition Team (DCT) may provide additional information for the Working Group's consideration. The settlement additionally provides that the Service may set OMR flows more negative than -5000 cfs; flows as negative as -6100 cfs are allowed on an experimental basis if the "best available science and consideration of all factors…indicate that such flows would be adequately protective" of delta smelt. This rate of flow could apply if the risk of entrainment is believed to be low, based upon evaluation of physical and biological monitoring results.

The 3-day, 3-station average water temperature surpassed 12°C on March 10, 2 spent female delta smelt were detected in SKT survey 3, and 1 delta smelt larva was collected during the 20mm Survey #1, any of which meet or exceed the criteria for the implementation of Action 3,

entrainment protection for larval smelt. The temperature criterion may indicate that protections are needed based upon the assumption that delta smelt spawning is in progress, whereas the observation of spent females and/or larvae provides direct evidence of spawning. Peak daily adult salvage exceeding a one:one ratio to the FMWT Index may also indicate that the risk of entrainment is unacceptably high (B.O., pp 346-347).

The Working Group discussed the salvage events from March 15 through 20. The Group felt that this small amount of salvage was not enough to elevate concern for entrainment into the high-risk scenario described in the B.O. Additionally, outflow as of March 20 was estimated to be 140,000 cfs and San Joaquin River flow was above 10,000 cfs and climbing as of early March 21, which the Working Group felt would greatly assist any larvae in the central and south Delta in moving downstream and out of the influence of the south Delta pumps.

The Working Group estimated that the overall risk of entrainment for larvae and adults was low given the distributional data from recent surveys. Although turbidity has increased at a number of stations throughout the Delta, hydrology remains favorable, indicating a low level of risk for entrainment. Apparent abundance remains very low, which raises the concern level for the species into the moderate range. The risk of delta smelt entering the central and south Delta is expected to remain low, due to anticipated export pumping and flows for the San Joaquin and Sacramento Rivers.

The Working Group did not receive any advice from the DCT.

The Working Group believes that, based upon what is known of Delta conditions and delta smelt distribution, a modification of Project operations to protect delta smelt is not yet warranted.

WEEKLY ADVICE FOR THE DEPARTMENT OF FISH AND GAME FOR LONGFIN SMELT

Recommendation for week of March 21, 2011:
The Smelt Working Group does not have any advice based on longfin smelt information. San Joaquin River at Vernalis flows surpassed 8,000 cfs on Saturday February 19 and continues above that level.

Basis for recommendation:
The 2009 State Water Project 2081 for longfin smelt states that advice to the DFG Director shall be based on:

1. Adult Salvage – total adult (>=80mm) longfin smelt salvage (State Water Project + Central Valley Project) for December through February > 5 times the Fall Midwater Trawl longfin smelt annual abundance index.

2. Adult abundance, distribution or other information indicates that OMR flow advice is warranted.

3. Larva distribution in the Smelt Larva Survey or the 20mm Survey finds longfin smelt larvae present at 8 of 12 Central and South Delta sampling stations in 1 survey (809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, and 919).

4. Larva catch per tow exceeds 15 longfin smelt larvae or juveniles in 4 or more of the 12 survey stations listed.

As of March 20, no longfin smelt have been salvaged since the first longfin smelt of the season was salvaged on January 14, 2011 and none have been collected in the central or south Delta in fish surveys in February. No advice is warranted based on this criterion.

Longfin smelt larvae were detected during the Smelt Larva Survey #1 (January 18-19), providing evidence of spawning, which initiated SWP Longfin Smelt ITP section 5.2 to protect larval and juvenile longfin smelt. However, OMR restrictions under section 5.2 are not required when river flows are: 1) greater than 55,000 cfs on the Sacramento River at Rio Vista; or 2) greater than 8,000 cfs on the San Joaquin River at Vernalis. Sacramento River flow at Rio Vista was briefly above 55,000 cfs December 21-23 and San Joaquin River flow surpassed 8,000 cfs on December 20 and dropped below the 8000 cfs on January 31. San Joaquin River flow surpassed 8,000 cfs once again on February 19th and increased above 12,000 cfs on February 27, then began a slow decline reaching 8,100 on March 17 before climbing again (Figure 1). Sacramento River flow has fluctuated well below the 55,000 cfs criterion level, but increased in mid March and surpassed the criterion about March 18 (Figure 2).

As of March 20, San Joaquin River flows remained above the 8,000 cfs threshold, Sacramento River flow at Rio Vista surpassed 55,000 cfs on March 18 and Qwest for March 17 was 21,800 cfs (Delta Hydrologic Conditions), indicating strong westward flows and little risk of entrainment for longfin smelt larvae. Moreover the most recent Smelt Larva Survey data (#4) indicate that recently hatched larvae were transported westward out of the central Delta (Table 1); the first 20mm Survey data also show westward transport with no larvae in the central or south Delta (Table 2). During Smelt Larva Survey (SLS #3, February 14 and 15), the larva distribution trigger was surpassed (criteria #3 above) and **OMR flow advice was warranted. However, no advice is given, because Qwest remained positive and San Joaquin River flows surpassing the 8000 cfs threshold, relaxing longfin smelt larval concerns.** During Smelt Larva Survey 4, longfin smelt larvae were caught at 5 of 12 central and south Delta criteria stations, but in very low numbers (Table 1). The low frequency of detection and low catches at positive stations indicate that the strongly positive Qwest (>8,500 cfs since February 19) has transported previously hatched larvae westward and that recent hatching has not replenished larva numbers within the central and south Delta. No additional advice to protect larvae is warranted at this time based on criteria 3 and 4.

Barker Slough export pumping advice shall apply January 15 through March 31 of dry and critically dry years. Currently the Sacramento River is classified as below normal (http://cdec.water.ca.gov/cgi-progs/reports/EXECSUM), so no Barker Slough advice is warranted.

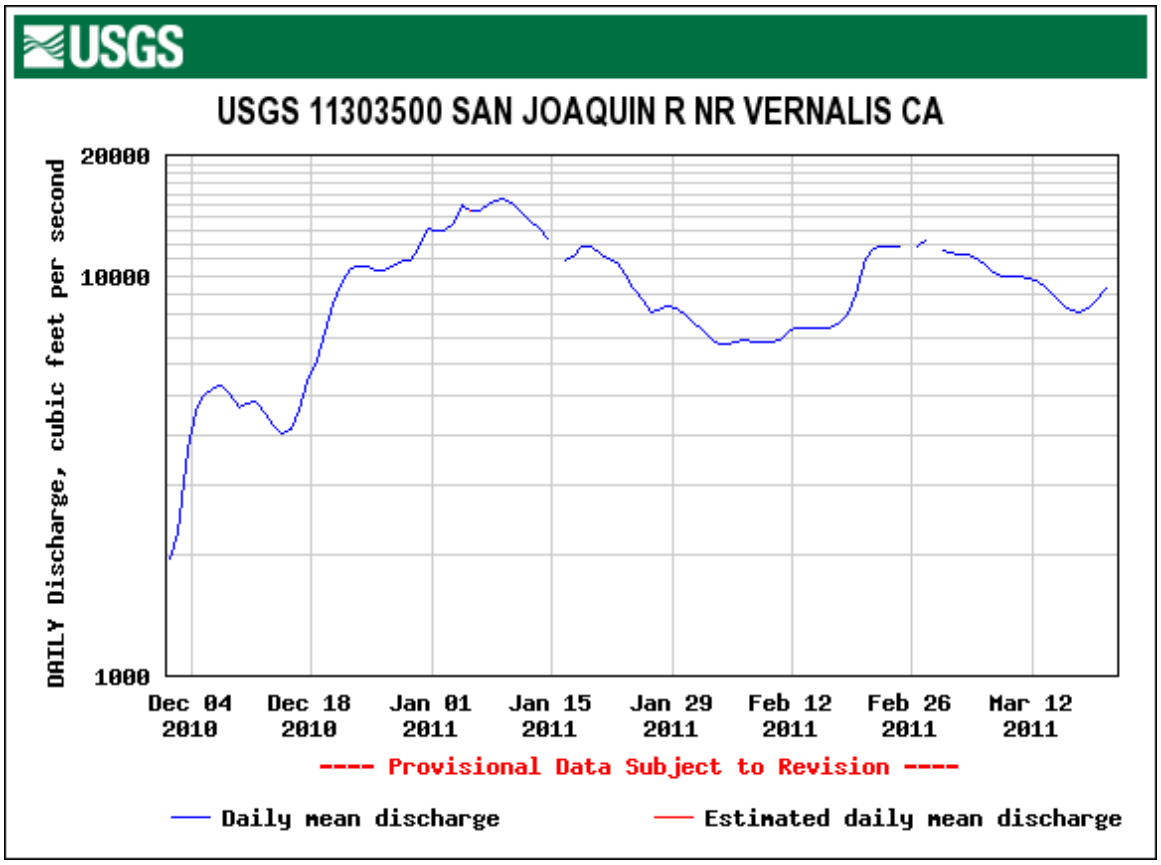


Figure 1. Tidally averaged San Joaquin River flow measured near Vernalis, December 1, 2010 through March 20, 2011.

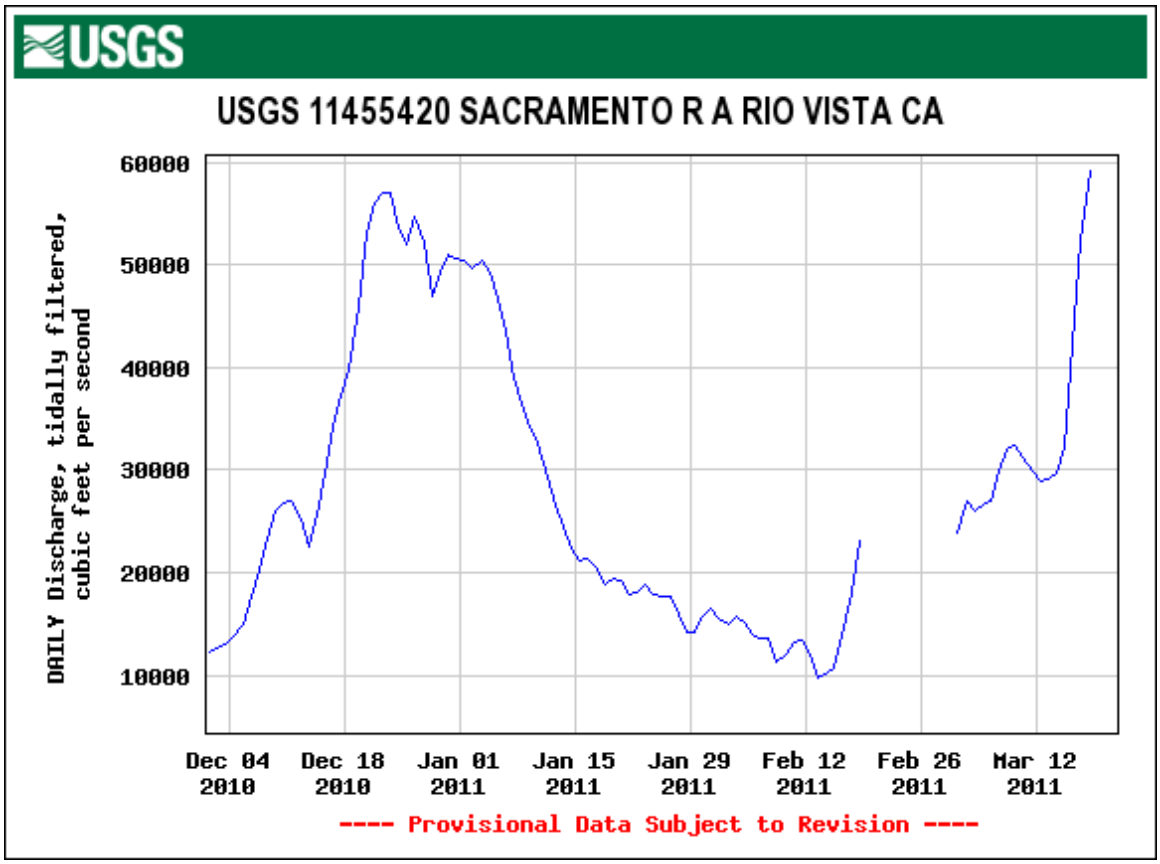


Figure 2. Tidally averaged Sacramento River flows measured at Rio Vista, December 1, 2010 through March 18, 2011.

Table 1. Longfin smelt catch per station from 2011 Smelt Larva Survey, Survey 4 (sample processing complete).

Year	Survey	SLS Station	Sample Status	Species	Smelt Catch
2011	4	405	Processed	Longfin Smelt	137
2011	4	411	Processed	Longfin Smelt	297
2011	4	418	Processed	Longfin Smelt	219
2011	4	501	Processed	Longfin Smelt	46
2011	4	504	Processed	Longfin Smelt	65
2011	4	508	Processed	Longfin Smelt	51
2011	4	513	Processed	Longfin Smelt	40
2011	4	519	Processed	Longfin Smelt	39
2011	4	520	Processed	Longfin Smelt	23
2011	4	602	Processed	Longfin Smelt	61
2011	4	606	Processed	Longfin Smelt	102
2011	4	609	Processed	Longfin Smelt	51
2011	4	610	Processed	Longfin Smelt	10
2011	4	703	Processed	Longfin Smelt	3
2011	4	704	Processed	Longfin Smelt	14
2011	4	705	Processed	Longfin Smelt	13
2011	4	706	Processed	Longfin Smelt	14
2011	4	707	Processed	Longfin Smelt	28
2011	4	711	Processed	Longfin Smelt	2
2011	4	716	Processed	Longfin Smelt	13
2011	4	723	Processed	Longfin Smelt	16
2011	4	801	Processed	Longfin Smelt	10
2011	4	804	Processed	Longfin Smelt	1
2011	4	809	Processed	Longfin Smelt	2
2011	4	812	Processed	Longfin Smelt	3
2011	4	815	Processed	Longfin Smelt	2
2011	4	901	Processed	Longfin Smelt	3
2011	4	902	Processed	Longfin Smelt	1
2011	4	906	Processed		No Smelt Catch
2011	4	910	Processed		No Smelt Catch
2011	4	912	Processed		No Smelt Catch
2011	4	914	Processed		No Smelt Catch
2011	4	915	Processed		No Smelt Catch
2011	4	918	Processed		No Smelt Catch
2011	4	919	Processed		No Smelt Catch

Table 2. Longfin smelt catch per station from 2011 20mm Survey, Survey 1 (sample processing incomplete).

Year	Survey	Station	Date	# Tows Processed	Species	Total Catch
2011	1	323	17-Mar-11	0		
2011	1	340	16-Mar-11	0		
2011	1	342	16-Mar-11	0		
2011	1	343	16-Mar-11	3	Longfin Smelt	5
2011	1	344	16-Mar-11	0		
2011	1	345	16-Mar-11	0		
2011	1	346	16-Mar-11	3	No Longfin Catch	
2011	1	405	17-Mar-11	0		
2011	1	411	17-Mar-11	0		
2011	1	418	17-Mar-11	0		
2011	1	501	15-Mar-11	3	Longfin Smelt	20
2011	1	504	15-Mar-11	3	Longfin Smelt	240
2011	1	519	15-Mar-11	3	Longfin Smelt	8
2011	1	602	15-Mar-11	3	Longfin Smelt	11
2011	1	606	15-Mar-11	3	Longfin Smelt	9
2011	1	609	15-Mar-11	3	Longfin Smelt	24
2011	1	610	15-Mar-11	3	Longfin Smelt	1
2011	1	508	16-Mar-11	3	Longfin Smelt	7
2011	1	513	16-Mar-11	3	Longfin Smelt	1
2011	1	520	16-Mar-11	3	No Longfin Catch	
2011	1	801	16-Mar-11	3	Longfin Smelt	1
2011	1	804	16-Mar-11	3	Longfin Smelt	3
2011	1	703	16-Mar-11	3	No Longfin Catch	
2011	1	704	16-Mar-11	3	Longfin Smelt	1
2011	1	705	15-Mar-11	3	No Longfin Catch	
2011	1	706	15-Mar-11	3	No Longfin Catch	
2011	1	707	15-Mar-11	3	No Longfin Catch	
2011	1	711	14-Mar-11	3	No Longfin Catch	
2011	1	716	14-Mar-11	3	No Longfin Catch	
2011	1	718	14-Mar-11	3	Longfin Smelt	121
2011	1	719	14-Mar-11	3	Longfin Smelt	1
2011	1	720	14-Mar-11	3	Longfin Smelt	5
2011	1	723	14-Mar-11	3	No Longfin Catch	
2011	1	724	14-Mar-11	3	No Longfin Catch	
2011	1	726	14-Mar-11	3	No Longfin Catch	
2011	1	809	14-Mar-11	3	Longfin Smelt	1
2011	1	812	15-Mar-11	3	No Longfin Catch	
2011	1	815	15-Mar-11	3	No Longfin Catch	
2011	1	901	14-Mar-11	3	No Longfin Catch	
2011	1	902	14-Mar-11	3	No Longfin Catch	
2011	1	906	15-Mar-11	3	No Longfin Catch	
2011	1	910	15-Mar-11	3	No Longfin Catch	
2011	1	912	15-Mar-11	3	No Longfin Catch	
2011	1	914	14-Mar-11	3	No Longfin Catch	
2011	1	915	14-Mar-11	3	No Longfin Catch	
2011	1	918	14-Mar-11	3	No Longfin Catch	
2011	1	919	14-Mar-11	3	No Longfin Catch	

Sample processing is through 3/18/10.

The Smelt Working Group will reconvene on Monday, March 28 at 10 am to review the updated environmental, salvage, and survey data.